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Notice of Allowability	Application No.	Applicant(s)	
	10/661,319	ARMSTRONG ET AL.	
	Examiner	Art Unit	
	Kara E. Geisel	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--
 All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 14 April, 2006.
2. ☒ The allowed claim(s) is/are 1-59, 61, 62, 64, 65, 67-72, 74-79 and 81-186.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

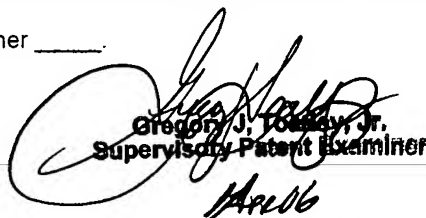
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>0406</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |


 Gregory J. Tolson, Jr.
 Supervisory Patent Examiner
 Apr 06

DETAILED ACTION

Examiner's Amendment

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Philip Askenazy on April 25th, 2006.

The application has been amended as follows:

In regards to claims 82, 102, 106, 139, 143, 151, 175, and 183, these claims have been amended to show the structural relationship between the fractal medium and the microcavity, in order to place the claims in condition for allowance.

The amended claims appear below:

82. An optical enhancing material comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity.

102. An optical sensor comprising:

a fractal medium;

a microcavity, wherein the medium is located in the vicinity of the microcavity;

a light source incident on said medium; and

one or more detectors for detecting light emitted from said medium.

106. An optical sensing method comprising the steps of:

providing a doped fractal medium;

locating the doped fractal medium proximate a medium;

employing a microcavity, wherein the doped fractal medium is located in the vicinity of the microcavity;

Art Unit: 2877

exciting the doped fractal medium with a light source; and
detecting light emitted from said doped fractal medium.

139. An optical amplifier comprising:
a fractal medium;
a microcavity, wherein the medium is located in the vicinity of the microcavity; and
a light source incident on said medium.

143. An optical amplification method comprising the steps of:
providing a fractal medium;
providing a microcavity, wherein the medium is located in the vicinity of the
microcavity;
providing an input signal; and
exciting the medium with a light source.

151. An optical switching method comprising the steps of:
providing a fractal medium;
providing a microcavity, wherein the medium is located in the vicinity of the
microcavity;
providing an input signal; and
exciting the medium with a light source.

175. A photobiological enhancing method comprising the steps of:
providing a fractal medium;
providing a microcavity, wherein the medium is located in the vicinity of the
microcavity;
providing a photobiological agent placed proximate the medium; and
exciting the medium and photobiological agent with a light source.

Art Unit: 2877

183. A method of generation of sub-femtosecond pulses comprising the steps of:
providing a fractal medium;
providing a microcavity, wherein the medium is located in the vicinity of the microcavity;
exciting the medium with a light source; and
detecting the sub-femtosecond pulses using one or more near-field detectors.

Examiner's Reasons for Allowance

Claims 1-25, 59, 61-62, 64-65, 67-72, 74-79, 81-109, 116-118, 130-154, 163-166, and 171-186, are allowed over the prior art of record.

Claims 26-58, 110-115, 119-129, 155-162, and 167-170, are allowed over the prior art of record for the reasons set forth in the previous Office Action (paper number 0106).

The following is an examiner's statement of reasons for allowance:

As to claim 1, the prior art of record, taken alone or in combination, fails to disclose or render obvious a light emitting apparatus comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 1.

As to claim 12, the prior art of record, taken alone or in combination, fails to disclose or render obvious a method of enhancing the optical emission of a material comprising providing a fractal medium and locating the medium in the vicinity of a microcavity, in combination with the rest of the limitations of claim 12.

As to claim 20, the prior art of record, taken alone or in combination, fails to disclose or render obvious an amplifying apparatus having a gain greater than 1.2, comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 20.

Art Unit: 2877

As to claim 23, the prior art of record, taken alone or in combination, fails to disclose or render obvious a method of amplification comprising providing a fractal medium and locating the medium in the vicinity of a microcavity to amplify optical emission, in combination with the rest of the limitations of claim 23.

As to claim 59, the prior art of record, taken alone or in combination, fails to disclose or render obvious an optical sensing enhancing material comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 59.

As to claim 62, the prior art of record, taken alone or in combination, fails to disclose or render obvious a method of making an optical sensing enhancing material comprising providing a microcavity and locating a fractal medium in the vicinity of the microcavity, in combination with the rest of the limitations of claim 62.

As to claim 65, the prior art of record, taken alone or in combination, fails to disclose or render obvious an optical sensor comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 65.

As to claim 72, the prior art of record, taken alone or in combination, fails to disclose or render obvious an optical sensing method comprising providing a doped fractal medium with a material and locating the medium in the vicinity of a microcavity, in combination with the rest of the limitations of claim 72.

As to claim 79, the prior art of record, taken alone or in combination, fails to disclose or render obvious a method of detecting a material comprising exciting both the material and a fractal medium in a vicinity of a microcavity with at least one light source, in combination with the rest of the limitations of claim 79.

Art Unit: 2877

As to claim 82, the prior art of record, taken alone or in combination, fails to disclose or render obvious an optical enhancing material comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 82.

As to claim 102, the prior art of record, taken alone or in combination, fails to disclose or render obvious an optical sensor comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 102.

As to claim 106, the prior art of record, taken alone or in combination, fails to disclose or render obvious an optical sensing method comprising providing a doped fractal medium, employing a microcavity, wherein the doped fractal medium is located in the vicinity of a microcavity, in combination with the rest of the limitations of claim 106.

As to claim 116, the prior art of record, taken alone or in combination, fails to disclose or render obvious a gratingless spectrometer comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 116.

As to claim 130, the prior art of record, taken alone or in combination, fails to disclose or render obvious an enhanced optical limiting material comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 130.

As to claim 133, the prior art of record, taken alone or in combination, fails to disclose or render obvious an enhanced optical limiting device comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 133.

Art Unit: 2877

As to claim 136, the prior art of record, taken alone or in combination, fails to disclose or render obvious a microlaser comprising a fractal medium and a microcavity, wherein the medium is located on or within the microcavity, in combination with the rest of the limitations of claim 136.

As to claim 139, the prior art of record, taken alone or in combination, fails to disclose or render obvious an optical amplifier comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 139.

As to claim 143, the prior art of record, taken alone or in combination, fails to disclose or render obvious an optical amplification method comprising providing a fractal medium, providing a microcavity, wherein the fractal medium is located in the vicinity of a microcavity, in combination with the rest of the limitations of claim 143.

As to claim 147, the prior art of record, taken alone or in combination, fails to disclose or render obvious an optical switch comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 147.

As to claim 151, the prior art of record, taken alone or in combination, fails to disclose or render obvious an optical switching method comprising providing a fractal medium, providing a microcavity, wherein the fractal medium is located in the vicinity of a microcavity, in combination with the rest of the limitations of claim 151.

As to claim 163, the prior art of record, taken alone or in combination, fails to disclose or render obvious a photochemical enhancing device comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 163.

As to claim 171, the prior art of record, taken alone or in combination, fails to disclose or render obvious a photobiological enhancing device comprising a fractal medium and a microcavity, wherein the

Art Unit: 2877

medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 171.

As to claim 175, the prior art of record, taken alone or in combination, fails to disclose or render obvious a photobiological enhancing method comprising providing a fractal medium, providing a microcavity, wherein the fractal medium is located in the vicinity of a microcavity, in combination with the rest of the limitations of claim 175.

As to claim 179, the prior art of record, taken alone or in combination, fails to disclose or render obvious a sub-femtosecond pulse generation device comprising a fractal medium and a microcavity, wherein the medium is located in the vicinity of the microcavity, in combination with the rest of the limitations of claim 179.

As to claim 183, the prior art of record, taken alone or in combination, fails to disclose or render obvious a method of generation of sub-femtosecond pulses comprising providing a fractal medium, providing a microcavity, wherein the fractal medium is located in the vicinity of a microcavity, in combination with the rest of the limitations of claim 183.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

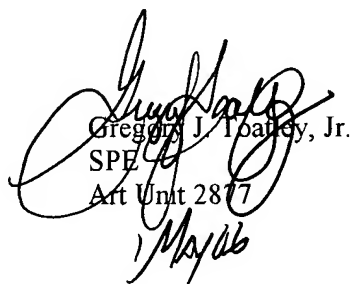
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kara E Geisel whose telephone number is 571 272 2416. The examiner can normally be reached on Monday through Friday, 8am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on 571 272 2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571 273 8300.

Art Unit: 2877

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Gregory J. Bailey, Jr.
SPE
Art Unit 2877
1 May 06

K.G.
KEG
April 26, 2006